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AGRICULTURAL MEMORANDUM NO. 396

Heavy rains and field drainage 2. MIDLANDS

L P Smith

Of the 35 sample stations mentioned in Ag. Mem. 395, 6 were in Midland England, namely:-

21	Cranwell (597 mm)	24	Loughborough (715 mm)
22	Oxford (652 mm)	25	Birmingham (780 mm)
23	Cheltenham (693 mm)	26	Longton (837 mm)

The following results were obtained for rains of 50 mm or more, 75 mm or more and 100 mm or more over periods of 1, 2, 3 . . . . 8 days (Period 1951-1960)

Table 2A Total occasions in 10 years
Table 2B Occasions in 10 years when soil was below capacity
Table 2C Occasions in 10 years when soil was at capacity

In the process of smoothing, extrapolation beyond the sample rainfall range was possible by reference to the results for northern stations.

At the lower end of the rainfall range, Cranwell (station 21) showed more similarity with the results for eastern England.

Towards the Yorkshire border there exists rainfall averages of about 570 mm which may not show this trend. The York (station 11) data fit the 8 day curve very well, so that the smoother frequencies for the area north of Gainsborough are probably

3 occasions of 50 mm or more in 6 days or less
7 occasions of 50 mm or more in 7 days or less
15 occasions of 50 mm or more in 8 days or less

The other smoothings are given in the following tables (soil at capacity)

Table 2D Occasions in 10 years 50 mm or more 1-8 days 600-1000mm
Table 2E Occasions in 10 years 75 mm or more 1-8 days 600-1000mm
Table 2F Occasions in 10 years 100 mm or more 1-8 days 600-1000mm
Table 2G Occasions in 10 years in individual categories of days and rainfall

Any comments or suggestions on this paper should be referred to the author.

Meteorological Office
Bracknell
Berks

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TABLE 2A Total occasions in 10 years (a) 50–75 mm (b) 75–100 mm (c) Over 100 mm

Site		Annual Average		Period of days 1	2	3	4	5	6	7	8 days of less
21.	Cranwell (Lincs)	597	(a)	1	3	6	10	17	35	50	68
			(b)	0	0	0	0	0	1	3	5
			(c)	0	0	0	0	0	0	0	0
			TOTAL	1	3	6	10	17	36	53	73
22.	Oxford	652	(a)	1	2	3	9	20	41	63	99
			(b)	2	4	6	8	11	14	19	26
			(c)	0	0	0	0	0	0	0	1
			TOTAL	3	6	9	17	31	55	82	126
23.	Cheltenham (Glous)	693	(a)	1	3	8	23	45	60	88	129
			(b)	0	0	0	0	2	8	15	19
			(c)	0	0	0	0	0	0	0	1
			TOTAL	1	3	8	23	47	68	103	149
24.	Loughborough (Leic.)	715	(a)	0	3	12	21	36	53	79	115
			(b)	0	0	0	0	3	7	11	15
			(c)	0	0	0	0	0	1	2	3
			TOTAL	0	3	12	21	39	61	92	133
25.	Birmingham (Warwick)	780	(a)	0	4	12	26	44	73	102	136
			(b)	0	0	0	1	5	9	16	20
			(c)	0	0	0	0	0	1	5	10
			TOTAL	0	4	12	27	49	83	123	166
26.	Longton (Staffs)	837	(a)	0	2	12	30	51	78	112	167
			(b)	0	0	0	1	5	12	21	24
			(c)	0	0	0	0	0	0	1	5
			TOTAL	0	2	12	31	56	90	134	196

TABLE 2B Soil below Capacity (a) 50-75 mm (b) 75-100 mm (c) Over 100 mm

Site	Annual Average		Period of days 1	2	3	4	5	6	7	8 days or less
Cranwell	597	(a)	1	3	6	10	17	32	44	57
		(b)	0	0	0	0	0	1	3	5
		(c)	0	0	0	0	0	0	0	0
		TOTAL	1	3	6	10	17	33	47	62
Oxford	652	(a)	1	2	3	7	11	17	21	35
		(b)	2	4	6	8	11	14	19	23
		(c)	0	0	0	0	0	0	0	1
		TOTAL	3	6	9	15	22	31	40	59
Cheltenham	693	(a)	1	2	4	13	23	31	47	64
		(b)	0	0	0	0	1	4	6	8
		(c)	0	0	0	0	0	0	0	0
		TOTAL	1	2	4	13	24	35	53	72
Loughborough	715	(a)	0	1	2	5	8	13	19	30
		(b)	0	0	0	0	0	1	2	3
		(c)	0	0	0	0	0	0	0	0
		TOTAL	0	1	2	5	8	14	21	33
Birmingham	780	(a)	0	1	3	5	10	19	29	40
		(b)	0	0	0	0	0	1	2	3
		(c)	0	0	0	0	0	0	0	0
		TOTAL	0	1	3	5	10	20	31	43
Longton	837	(a)	0	1	4	9	12	17	27	39
		(b)	0	0	0	0	1	2	3	4
		(c)	0	0	0	0	0	0	0	0
		TOTAL	0	1	4	9	13	19	30	43

TABLE 2C Soil at Capacity (a) 50-75 mm (b) 75-100 mm (c) Over 100 mm

Site	Annual Average		Period of days 1	2	3	4	5	6	7	8 days or less
Cranwell	597	(a)	0	0	0	0	0	3	6	11
		(b)	0	0	0	0	0	0	0	0
		(c)	0	0	0	0	0	0	0	0
		TOTAL	0	0	0	0	0	3	6	11
Oxford	652	(a)	0	0	0	2	9	24	42	64
		(b)	0	0	0	0	0	0	0	3
		(c)	0	0	0	0	0	0	0	0
		TOTAL	0	0	0	2	9	24	42	67
Cheltenham	693	(a)	0	1	4	10	22	29	41	65
		(b)	0	0	0	0	1	4	9	11
		(c)	0	0	0	0	0	0	0	1
		TOTAL	0	1	4	10	23	33	50	77
Loughborough	715	(a)	0	2	10	16	28	40	60	85
		(b)	0	0	0	0	3	6	9	12
		(c)	0	0	0	0	0	1	2	3
		TOTAL	0	2	10	16	31	47	71	100
Birmingham	780	(a)	0	3	9	21	34	54	73	96
		(b)	0	0	0	1	5	8	14	17
		(c)	0	0	0	0	0	1	5	10
		TOTAL	0	3	9	22	39	63	92	123
Longton	837	(a)	0	1	8	21	39	61	85	128
		(b)	0	0	0	1	4	10	18	20
		(c)	0	0	0	0	0	0	1	5
		TOTAL	0	1	8	22	43	71	104	153

TABLE 2D MIDLANDS 50 mm or more Occasions in 10 years Soil at Capacity

Annual Average	1	2	3	4	5	6	7	8 days or less
600	0	0	0	0	0	6	14	25
650	0	0	0	4	10	21	34	53
700	0	1	4	9	20	36	54	81
750	0	2	7	14	30	51	74	109
800	0	3	10	19	40	66	95	136
850	1	4	13	24	50	81	116	164
900	1	5	17	30	60	96	136	194
950	1	6	21	37	72	112	158	235
1000	2	8	25	45	85	130	180	280

TABLE 2E MIDLANDS 75 mm or more Occasions in 10 years Soil at Capacity

Annual Average	1	2	3	4	5	6	7	8 days or less
600	0	0	0	0	0	0	0	1
650	0	0	0	0	0	1	2	6
700	0	0	0	0	1	4	7	12
750	0	0	0	0	3	7	12	18
800	0	0	0	1	5	10	17	24
850	0	0	1	2	7	13	22	31
900	0	0	1	3	9	16	27	38
950	0	1	2	4	11	19	32	45
1000	0	1	2	5	13	23	38	53

TABLE 2F MIDLANDS 100 mm or more Occasions in 10 years Soil at Capacity

Annual Average	1	2	3	4	5	6	7	8 days or less
600	0	0	0	0	0	0	0	0
650	0	0	0	0	0	0	0	1
700	0	0	0	0	0	0	1	3
750	0	0	0	0	0	0	2	5
800	0	0	0	0	0	1	3	7
850	0	0	0	0	1	2	4	10
900	0	0	0	0	1	3	6	13
950	0	0	0	0	2	4	8	16
1000	0	0	0	0	2	5	10	20

TABLE 2G MIDLANDS Occasions in 10 years Soil at Capacity (a) 50-75 mm (b) 75-100 mm (c) Over 100 mm

Annual Average		Period 1	2	3	4	5	6	7	8	days but not less
600	(a)	0	0	0	0	0	6	8	10	
	(b)	0	0	0	0	0	0	0	1	
	(c)	0	0	0	0	0	0	0	0	
	TOTAL	0	0	0	0	0	6	8	11	25
650	(a)	0	0	0	4	6	10	12	15	
	(b)	0	0	0	0	0	1	1	3	
	(c)	0	0	0	0	0	0	0	1	
	TOTAL	0	0	0	4	6	11	13	19	53
700	(a)	0	1	3	5	10	13	15	22	
	(b)	0	0	0	0	1	3	2	3	
	(c)	0	0	0	0	0	0	1	2	
	TOTAL	0	1	3	5	11	16	18	27	81
750	(a)	0	2	5	7	13	17	18	29	
	(b)	0	0	0	0	3	4	3	3	
	(c)	0	0	0	0	0	0	2	3	
	TOTAL	0	2	5	7	16	21	23	35	109
800	(a)	0	3	7	8	17	21	22	34	
	(b)	0	0	0	1	4	4	5	3	
	(c)	0	0	0	0	0	1	2	4	
	TOTAL	0	3	7	9	21	26	29	41	136
850	(a)	1	3	8	10	21	25	26	39	
	(b)	0	0	1	1	4	5	7	3	
	(c)	0	0	0	0	1	1	2	6	
	TOTAL	1	3	9	11	26	31	35	48	164
900	(a)	1	4	11	11	24	29	29	47	
	(b)	0	0	1	2	5	5	8	4	
	(c)	0	0	0	0	1	2	3	7	
	TOTAL	1	4	12	13	30	36	40	58	194
950	(a)	1	4	14	14	28	32	33	64	
	(b)	0	1	1	2	5	6	9	5	
	(c)	0	0	0	0	2	2	4	8	
	TOTAL	1	5	15	16	35	40	46	77	235
1000	(a)	2	5	16	17	32	35	35	85	
	(b)	0	1	1	3	6	7	10	4	
	(c)	0	0	0	0	2	3	5	11	
	TOTAL	2	6	17	20	40	45	50	100	280